

**M A N U A L**  
**SIMRAD**  
**CA/CR40/42/50/52**

Installation manual  
183-0512-702 English

02244.30



1830512702



**11. Installation and service**

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List of Simrad distributors



## 11. Installation notes

For a number of reasons, all user-related decisions, setups, etc. should be noted in these two pages as they occur. This information may be helpful if your unit has been updated with new software, reset or in for service.

Transducer connections:	
Port	Transducer
ECHO1	
ECHO2	

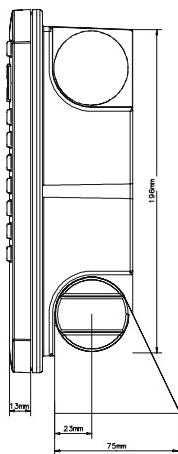
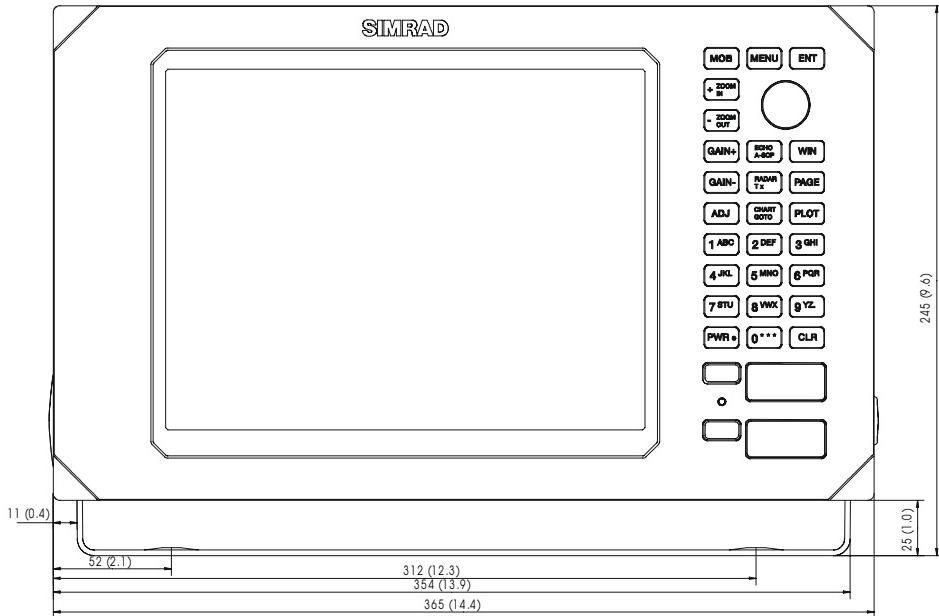
Echo setup:		
Transducer	Port	Transducer frequency and type
1	ECHO	
2	ECHO	

Other important settings:			
Radar antenna	Scanner Type: RB	Scanner Rotation:	rpm

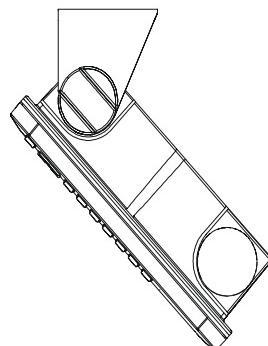
## Other important settings (continued):

## 11.1 Installation of CA/CR40/42 Navigation Center

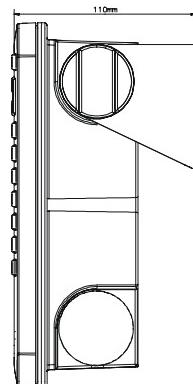
The CA/CR40/42 can be flat or bracket mounted – overhead, bulkhead or console.



Console

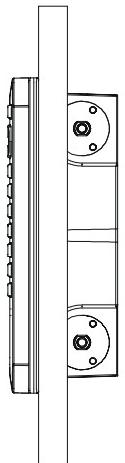


Overhead



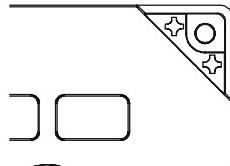
Bulkhead

Flush mounting for CA/CR40/42:

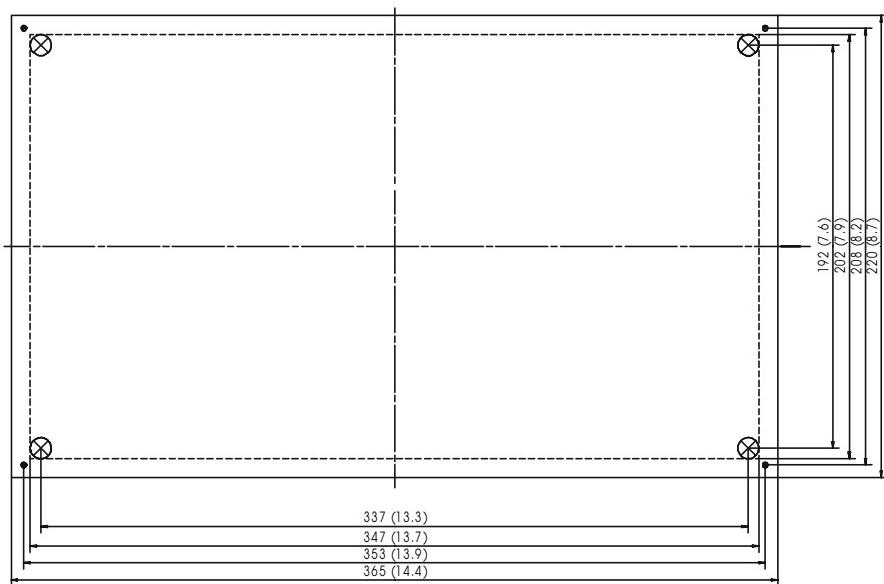


Min. clearance for  
cables: 15 cm.

Removable corner.

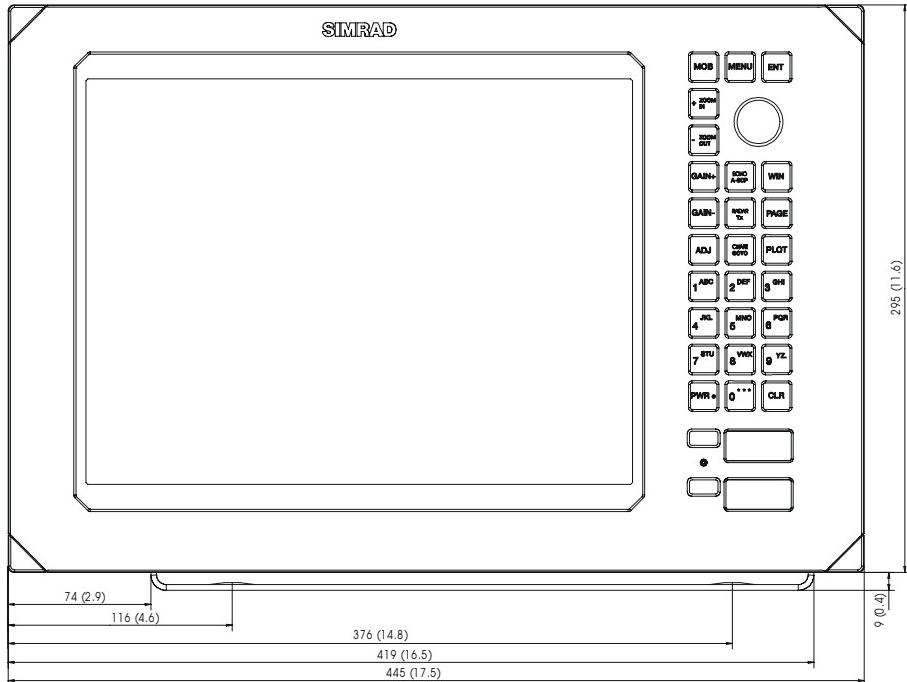


See template for instructions!

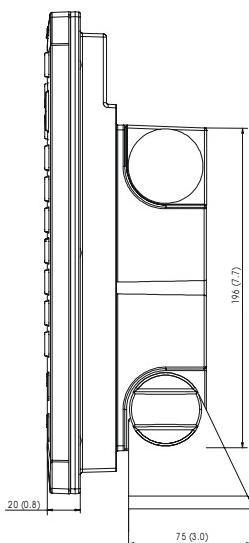


## 11.2 Installation of CA/CR50 Navigation Center

The CA/CR50 can be flat or bracket mounted – overhead\*, bulkhead\* or console.

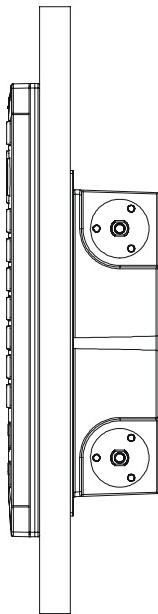


Console mounting



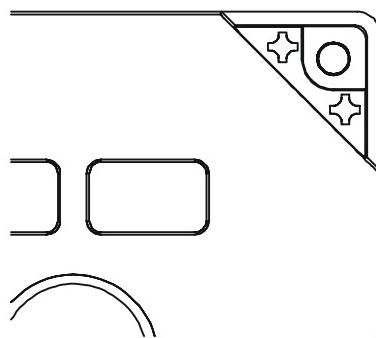
\* Overhead and bulkhead mounting is only possible if using a distance piece.

Flush mounting for CA/CR50:

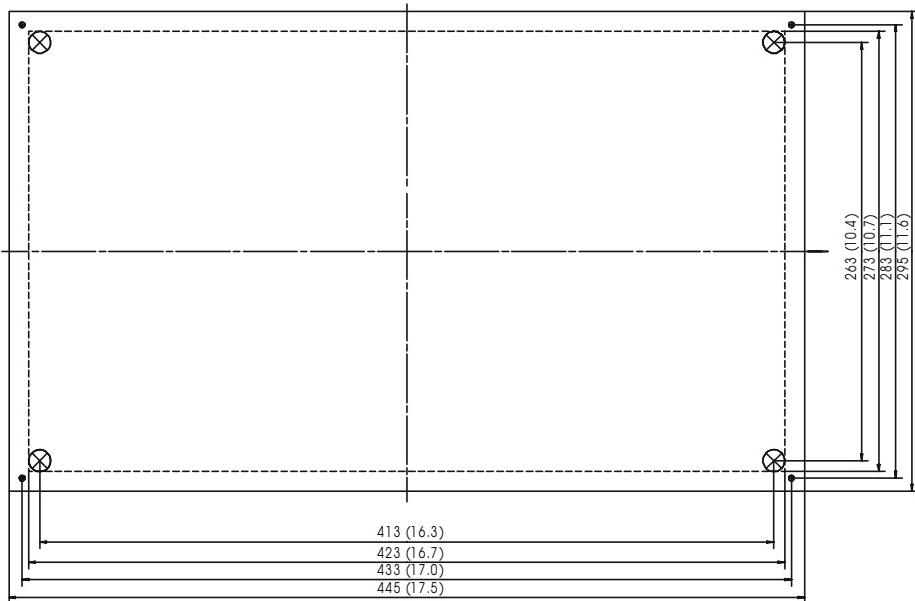


Min. clearance for  
cables: 18 cm.

Removable corners, example:

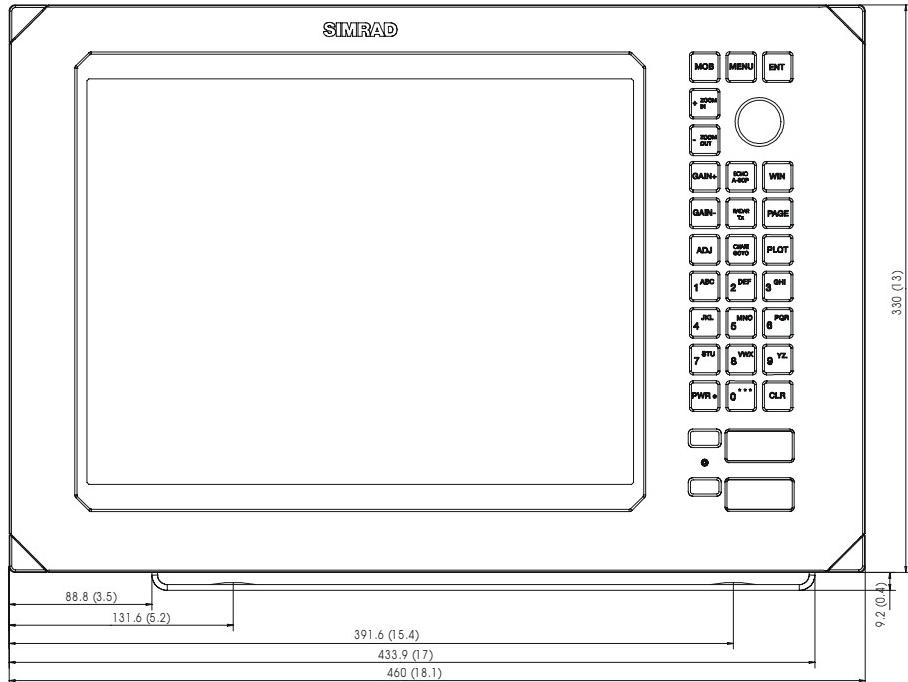


See template for instructions:

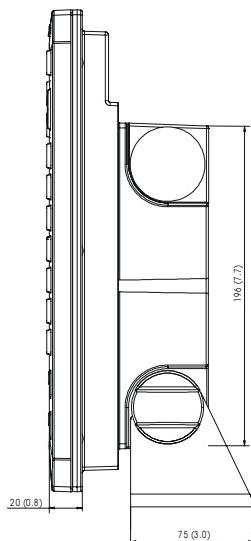


## 11.3 Installation of CA/CR52 Navigation Center

The CA/CR52 can be flat or bracket mounted – overhead\*, bulkhead\* or console.

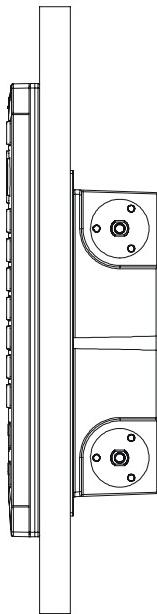


Console mounting



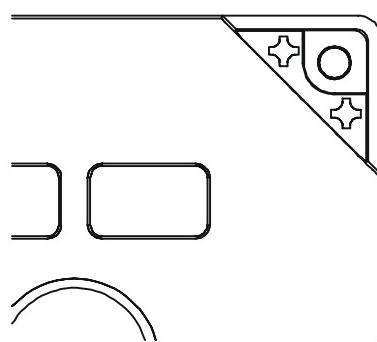
\* Overhead and bulkhead mounting is only possible if using a distance piece.

Flush mounting for CA/CR52:

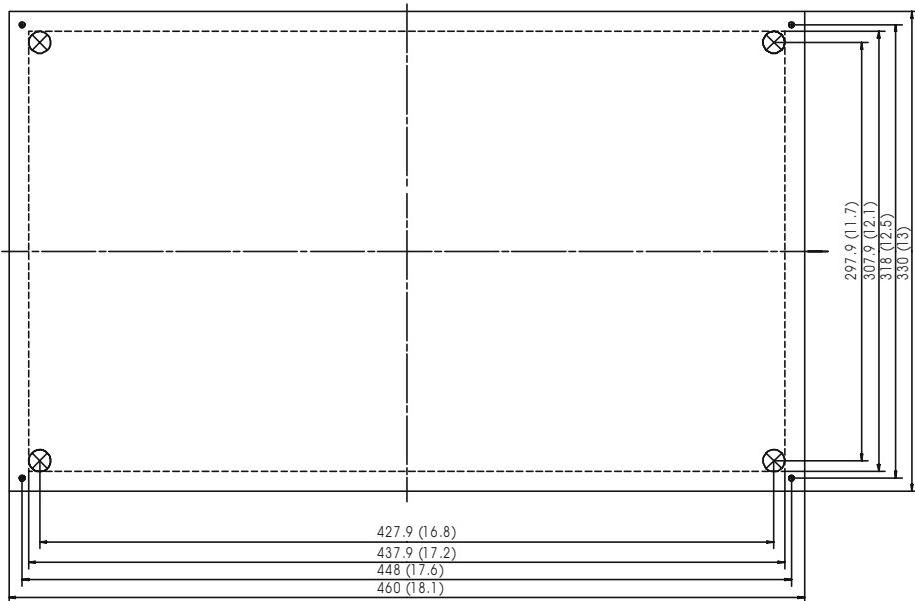


Min. clearance for  
cables: 18 cm.

Removable corners, example:



See template for instructions:



## 11.4 Place of installation of display unit

The display unit can be installed on desktop, wall surface, or ceiling. Determine the place to install the display unit that is convenient for navigation and radar operation after considering the following suggestions:

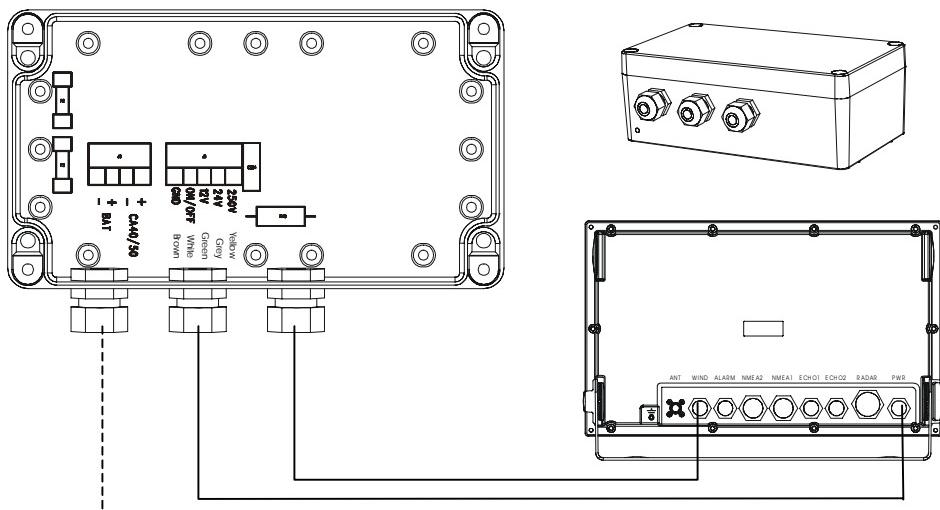
- there is a minimum clearance at the back of the unit of 15 cm (CA/CR40/42) or 18cm (CA/CR50/52).
- you can see the ship's bow when you raise your eyes from the display.
- there is limited exposure to direct sunlight - see environment temperature limits in section 11.13 Specifications.
- there is good ventilation and minimum vibration.
- there is a minimum distance of 50 cm to a magnetic compass.

## 11.5 Installation of Radar supply box RS4050

The external power supply, RS4050, must be connected to the CA/CR40/42/50/52 to run the radar function. Dimensions: H:125mm, L:222mm, D:81mm.

Connect power cable with 3 or 4 pin connector to the receptacle marked 'PWR' at the rear of the display unit, and the second 1.5m cable with 6-pin to the receptacle between 'ANT' and 'ALARM' at the rear of the display unit.

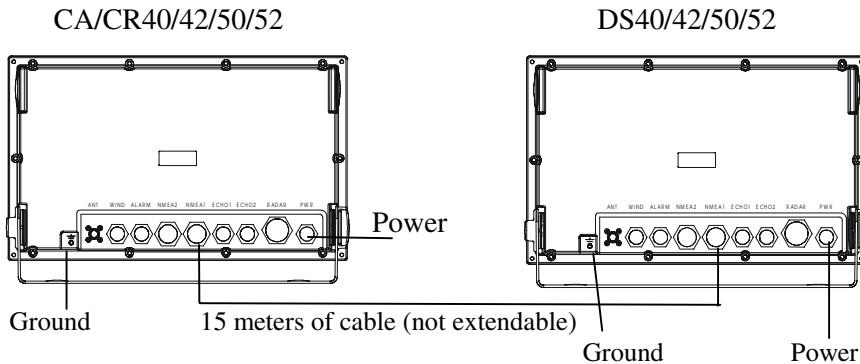
☞ 2 variants, refer to RS4050 addendum: 183-0700-001 or 183-0700-003.



Cable to ship's mains: 2x1.5 mm<sup>2</sup>, max. 5 m long (not included).

## 11.6 Installation of Dual Station DS40/42/50/52

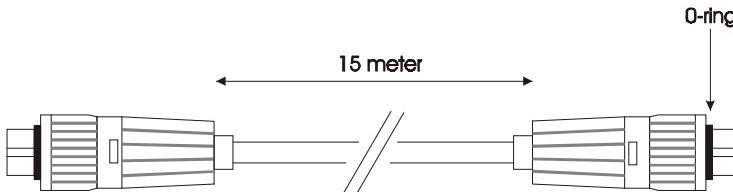
The DS models are remote control units for the CA/CR40/42/50/52 main units. The units with the same model numbers are identical in size e.g. DS42 and CR42 so the same installation guides can be used when performing the installation. When choosing a dual station, the unit does not have to match the main unit in size, as all the mentioned units are compatible.



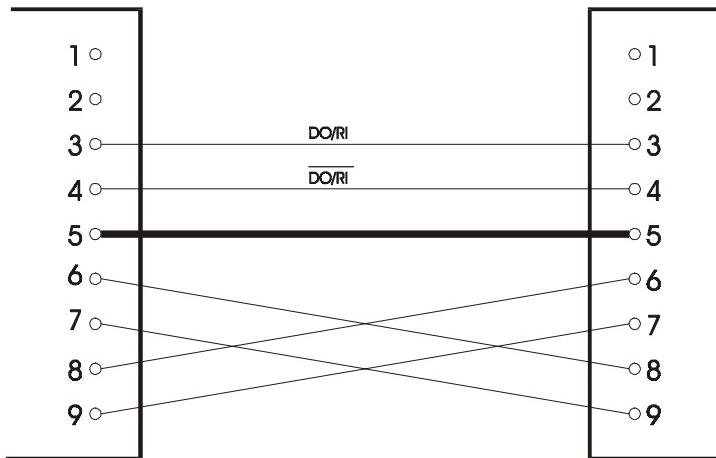
A special connection cable of 15 meters with two male plugs is supplied with the dual station. Push one of the male plugs into the receptacle marked NMEA1 on the back of the main unit and the second into the dual station.

The NMEA1 interface from the main unit is transferred to the dual station via the connection cable and is available on the dual station's NMEA2 receptacle.

☞ Refer to section 11.8 for details on pin numbers.



The connection cable between the dual station and the main unit is a special pair-twisted cable of 15 meters (not extendable), which consists of the following wires:



104.3002.023

### 11.6.1 Operation of DS40/42/50/52 Dual Station

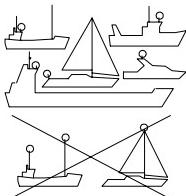
The main unit and the dual station operate in parallel.

All key commands are relayed to the main unit – CA/CR40/42/50/52 – and the display picture is instantly transferred back via a high speed data link.

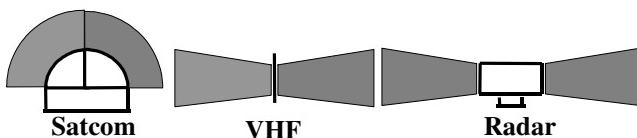
Adjust light/contrast in screen and background light in keypad via the [PWR] key.

Eject keys and cartridge drawers are blinded, and can not be opened on the dual station.

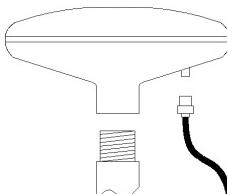
## 11.7 Installation of the GPS / DGPS antenna



The antenna must be placed in a position where tall constructions, steel wires, masts, etc. do not obstruct the view to the satellites. Do not, however, mount the antenna in the top of a mast or tower, as this may degrade the COG and SOG readings, especially if DGPS is used. Do not place the antenna close to sources of electrical interference, such as radar, satcom, etc. If installing the GPS antenna close to other antennas it must be placed either above or below the radiation beams. There is full coverage down to 20° below the horizon.

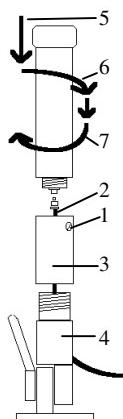


 **Beam area** – avoid installing the GPS antenna inside the beam areas.



### Mounting of DGPS antenna MGL-3

Mount the antenna on a standard US 1" 14 thread pipe, or optional standard antenna mount. Tighten firmly, but only by hand – no use of tools. Attach the antenna cable to the TNC socket.



### Mounting of GPS antenna RS5640

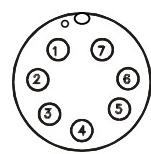
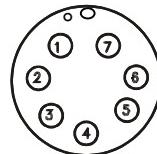
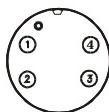
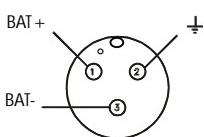
Loosen the screw (1) of the antenna adapter. Guide the antenna cable (2) through the adapter and connect it to the antenna. Screw the US 1" 14 mount adapter (3) firmly onto the optional antenna mount (4). Press (5) the antenna into the adapter and turn it (6) approx. ½ to 1 turn counter clockwise to “catch” the thread. Turn (7) clockwise 1 to 2 turns and firmly secure the antenna with the lock screw (1).

*☞ Do not close the small ventilation hole at the bottom, and do not attempt to open the antenna.*

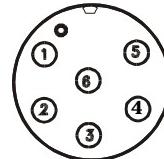
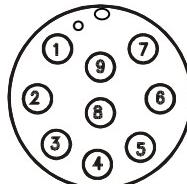
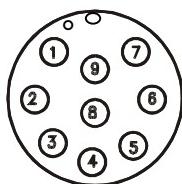
## 11.8 Electrical connections (connectors, seen from solder side)

The PWR receptacle will accommodate either 3 or 4 pin connectors, depending on model and version. (The ECHO2 port is sealed on CR models).

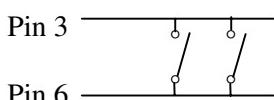
PWR (male mini-con-x)	ECHO2 (male mini-con-x)	ECHO1 (male mini-con-x)
1: + 10-32 Vdc, red 3: - Battery, black 2: Earth	1: - Radar, blue 2: + Radar, white 3: - Battery, black 4: + 10-32 Vdc, red	1: Depth I+ 2: Depth I- 3: Depth II+ 4: Shield 5: Depth II- 6: GND (Temp.) 7: Temp.



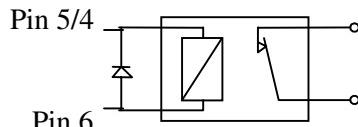
NMEA2 (male multi-con-x)	NMEA1 (female multi-con-x)	ALARM (male mini-con-x)
1: RTS (TL50) 2: DTR (TL50) 3: RXD (TL50) 4: TXD (TL50) 5: GND 6: NMEA2 TX A (DATA OUT) 7: NMEA2 TX B (RETURN) 8: NMEA2 RX A (DATA IN) 9: NMEA2 RX B (RETURN)	1: + 10-32 V out (Dual Station) 2: - Battery out (Dual Station) 3: DO / RI (Dual Station) 4: DO / RI (Dual Station) 5: GND 6: NMEA1 TX A (DATA OUT) 7: NMEA1 TX B (RETURN) 8: NMEA1 RX A (DATA IN) 9: NMEA1 RX B (RETURN)	1: RELAY A, white 2: RELAY B, brown 3: MOB, yellow 4: POS STATUS, green 5: LOG OUT, grey 6: GND, pink



### External MOB switches:

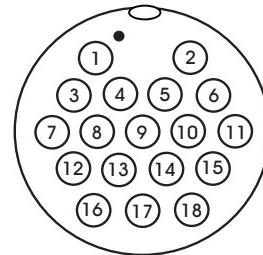


### External log/pos-status relay



**RADAR**

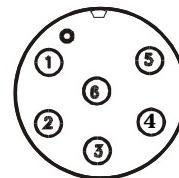
- 1: +250V, Violet
- 2: +24V, Blue
- 3: +12V, Orange thick
- 4: GND, Yellow
- 5: DATA RETURN, Red shield
- 6: DATA, Red center
- 7: N.C.
- 8: BP/SHF, Brown center
- 9: BP/SHF RETURN, Brown shield
- 10: V/TRG, Coax center
- 11: N.C.
- 12: BAT+, Red thick
- 13: N.C.
- 14: V/TRG RETURN, Coax shield
- 15: BAT-, Green thick
- 16: BAT+, Yellow thick
- 17: N.C.
- 18: BAT-, Blue thick



☞ Radar connection cables to scanners – see section 11.12.3.  
Pin numbers and wire colors, see section 11.12.4.

**Receptacle next to antenna connection ‘ANT’**

- 1: 12V/5mA, White
- 2: GND, Brown
- 3: NC
- 4: 12V/1.2A, Green
- 5: 250V/40mA, Yellow
- 6: 24V/20mA, Grey

**11.8.1 Power supply connections - (refer to section 11.5)**

The internal voltage regulator will allow the CA/CR40/42/50/52 to operate normally over the power supply voltage range from 10 to 32 Vdc. Connection between the CA/CR40/42/50/52 and the external power supply is accomplished by means of the supplied power cable, which is approximately 1.5 meters long, and are not extendable.

After connecting the cable to the power source, push the plug as far as it will go into the three/four pin receptacle marked “PWR” on the rear of the cabinet and turn the plug’s coupling ring clockwise until it makes a click.

3 pin power cable, with fuse F6.3A – 153-5000-003.

4 (2) pin power cable, with fuse F6.3A - 153-5000-005.

### 11.8.2 Fuse

Warning! A fuse should always be installed to protect the unit.

Using a fuse which is not specified for your equipment can cause it to blow the instant the CA/CR40/42/50/52 is switched on or it will not protect the equipment as intended – see fuse rating in section 11.13.

### 11.8.3 Transducer connection (CA models)

Most transducers are supplied with a 10 meter cable for connection to the echosounder unit – CA40/42/50/52. Push the female plug, as far as it goes, into the receptacle marked “ECHO1” or/and “ECHO2” on the rear of the cabinet and turn the plug’s coupling ring clockwise until it clicks into locked position

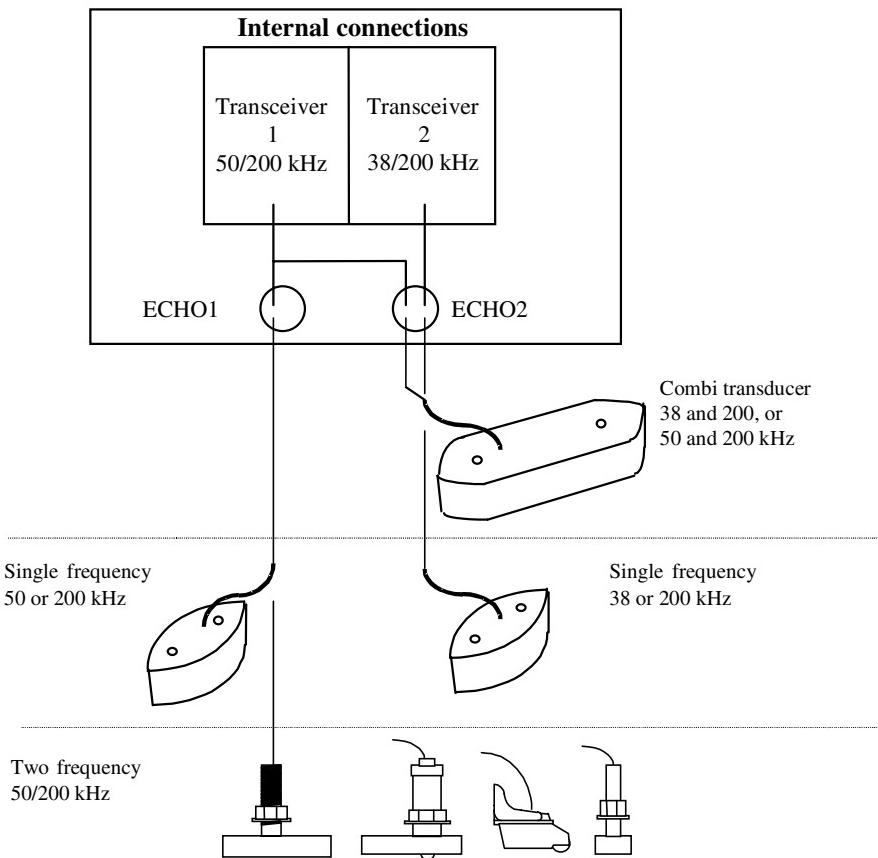
☞ The CA40/42/50/52 must be turned off while connecting/disconnecting the transducer cables.

### Recommended connection and setup of Simrad supplied transducers:

Transducer type	Port	Echosounder setup
Simrad 50/200 C	ECHO2	Simrad Combi C50/200
Simrad 38/200 C	ECHO2	Simrad Combi C38/200
Airmar B250	ECHO2	Airmar Combi B250-22
Airmar B260	ECHO2	Airmar Combi B250-22
Airmar P319, P52, P66, B117, B45, SS505, B744V, SS544V, B256	ECHO1	200kHz Airmar Des. A 50kHz Airmar Des. A
Airmar ST650	ECHO1	

☞ See Transducer connections next page, and Echosounder setup, section 7.8 in Operator’s manual.

## Transducer connections



### ⚠ Warning!

Transducers containing speed log sensor e.g. Airmar B744V must never be connected to the port "ECHO2". To avoid accidental connection, "ECHO2" is sealed with a small silicone plug, which of course is removable so e.g. a combi transducer can be connected.

### 11.8.4 NMEA0183 interface connections

NMEA0183 interface connections are made to the receptacle marked “NMEA1” or “NMEA2” on the rear of the cabinet – turn the plug’s coupling ring clockwise until it stops.

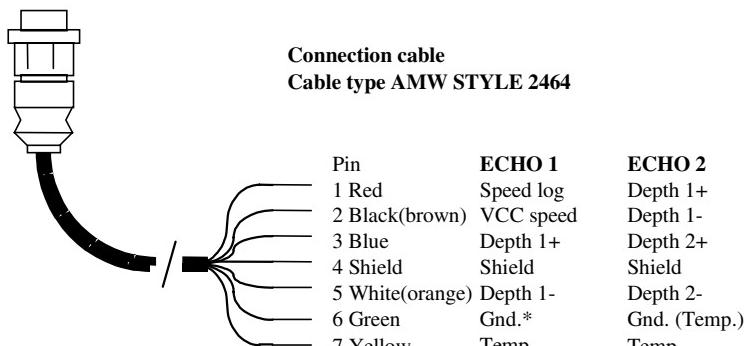
☞ The CA/CR40/42/50/52 must be turned off while connecting/disconnecting the interface cable.

### 11.8.5 PC up/download via NMEA connection

A PC can be connected via the NMEA port to enable exchange of waypoint and route data. See 11.10 Optional connections.

## 11.9 Universal connection cable (optional)

Transducers are recommended to be 60 to 80 ohms and minimum 1kW. The universal connection cable should be applied for connecting one or two transducers to either ECHO1 or ECHO2 port.



## 11.10 Optional connections

**General** e.g. Autopilot or performance instruments

CA/CR40/42/50/52 NMEA

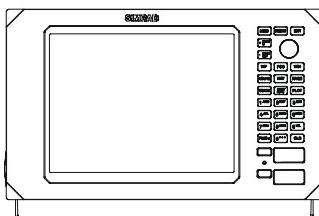
Pin 6 White TX A (DATA OUT)  
Pin 7 Brown TX B (RETURN)  
Pin 8 Yellow RX A (DATA IN)  
Pin 9 Green RX B (RETURN)

### PC up/download

CA/CR40/42/50/52 NMEA

Pin 6	White	TX A (DATA OUT)	SUB-D 9 pin
Pin 7	Brown	TX B (RETURN)	Pin 2
Pin 8	Yellow	RX A (DATA IN)	Pin 5
Pin 9	Green	RX B (RETURN)	Pin 3

### Overview of optional connections:



- Compass
- Dual station DS40/42/50/52
- Performance instruments
- Differential Beacon Receiver
- Water speed and temperature sensor
- Autopilot
- Yeoman digitizer
- Other equipment via NMEA 0183, 0182, 0180
- NMEA Buffer RS5345

## 11.11 Basic transducer and cable information (CA models)

For optimum performance of the Echosounder, the Simrad combi transducers C38/200 and C50/200 are recommended. These transducers also include a water temperature sensor. A variety of alternative medium-range transducers is available for vessels mainly operating in shallow waters and/or where the size of the transducer is critical.

The installation should be carefully planned in advance, keeping in mind the standard cable length of 10 meters (32 feet) which is connected to the transducer. In the event where the standard cable is not long enough, up to an additional 10 meters (32 feet) may be connected without affecting the performance of the system. The cable must be of the same type as the standard cable.

☞ The CA40/42/50/52 must be turned off while connecting/disconnecting the transducer cable.

The use of longer cable runs, while possible, always increases the likelihood of increased interference and decreased performance. Care must be taken when increasing the cable lengths to ensure that proper, adequate and consistent shielding is maintained, that cable of adequate cross section is used, and that all connections are properly made and protected from the effects of the marine environment.

If possible, running the transducer cable through a grounded conduit will greatly decrease the likelihood of interference. Likewise, the CA40/42/50/52 transducer cable should be run as far as possible from other electrical cabling. If it is absolutely necessary to pass close to other cabling, it is best to keep as much distance as possible, and to make all crossings as close to a right angle as possible.

The 1kW output signal from the echosounder is automatically reduced due to the difference of impedance in the transmitter, which is 75 ohms, and the transducer, which is 185 to 425 ohms. See section 7.8 Echosounder setup (in the Operator's manual) for correct setting for the transducer selected.

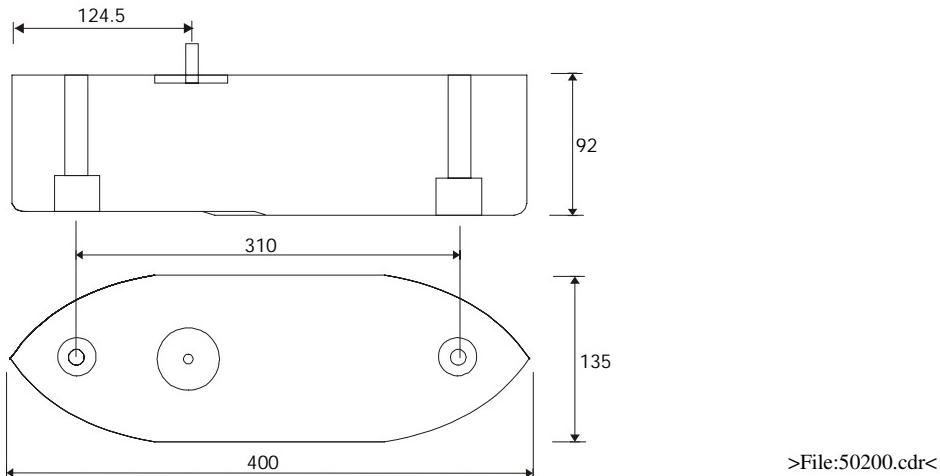
The CA40/42/50/52's transmitter is designed to match Simrad 1kW 75 ohms high performance transducers described in section 11.11.1 Transducers.

### ⚠ Warning!

Transducers containing speed log sensor e.g. Airmar B744V must never be connected to the port "ECHO2". To avoid accidental connection, "ECHO2" is sealed with a small silicone plug, which of course is removable so e.g. a combi transducer can be connected.

## 11.11.1 Transducers (optional)

### Simrad Combi-transducers C50/200 or C38/200



Combi C50/200 or C38/200 combines two transducers and a temperature sensor in one housing. It has a streamlined shape, designed for mounting onto the hull.

#### **Frequency:**

Beamwidth:

#### **50 and 200 kHz**

longitudinal 10° / 7°  
transverse 16° / 7°

#### **38 and 200 kHz**

longitudinal 13° / 7°  
transverse 21° / 7°

Maximum pulse power input:

1000 W

1000 W

Maximum continuous power input:

10 W

10 W

Storage temperature:

max. 70°C, min. -20°C

max. 70°C, min. -20°C

Cable length:

10m (32')

10m (32')

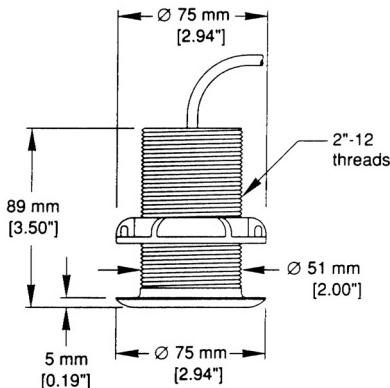
Maximum transducer depth:

20 meters

Reference No.  
700.3000

Reference No.  
700.3001

## Airmar P319



### Thru-hull mount

(not for use in wood hulls)

Frequency: 50/200 kHz

Beamwidth: 45° / 15°

Cable length: 10m (32')

Depth information.

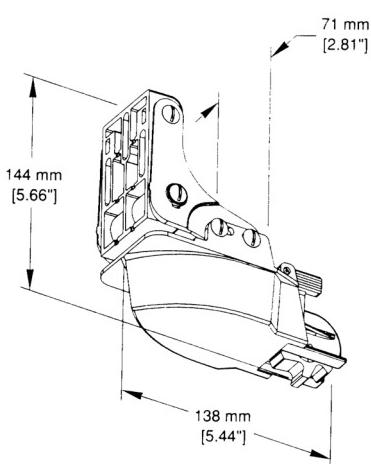
Reference No.179.0401.002 (P319)

Housing: reinforced plastic

Reference No.179.0401.003 (B117)

Housing: bronze

## Airmar P52



### Transsonic mount

(for fiberglass, aluminum, wood, or inflatable hulls)

Frequency: 50/200 kHz

Beamwidth: 45° / 15°

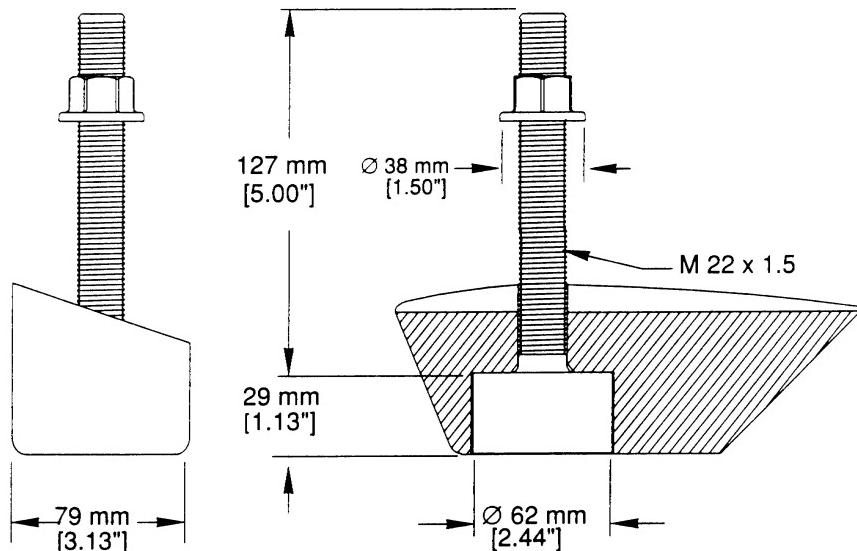
Cable length: 10m (32')

Speed, temperature + depth information.

Reference No. 179.0401.001

Housing: chemical resistant, high impact plastic alloy.

Do not connect to ECHO2 port!

**Airmar SS505****Thru-hull stem mount**

Accommodates hull thickness:

Min. no fairing 6 mm (1/4")

Max. with fairing 83 mm (3 1/4")

Ref. No.179.0401.011

Optional fairing.

Frequency: 50/200 kHz

Beamwidth: 45° / 15°

Cable length: 10m (32')

Depth information.

Ref. No.179.0401.004 (B45)

Housing: bronze

(fiberglass or wood hulls only)

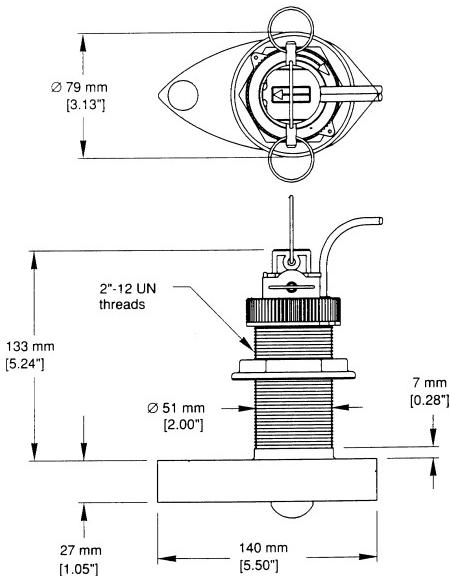
Ref. No.179.0401.008 (SS505)

Housing: stainless steel

(compatible with any hull material)

## Airmar B744V

top and side view



### Thru-hull triducer

Frequency: 50/200 kHz  
 Beamwidth: 45° / 15°  
 Cable length: 10m (32')  
 Speed, temperature + depth information.

Ref. No.179.0401.009  
 (B744V)  
 Housing: bronze

Do not connect to ECHO2 port.

### 11.11.2 Determining the position for the transducers

The CA40/42/50/52 is a sophisticated piece of electronic equipment, but how well it will perform under actual operating conditions will be largely dependent upon the location of the transducer and how it has been installed. Careful consideration, therefore, must be given to selecting the mounting location and on deciding the method of installation that best suits the vessel.

Air bubbles and turbulence caused by the vessel's movement through the water will seriously degrade the transducer's performance. Therefore the transducer should be located well clear of any water intake or discharge line and also clear of any projection along the hull line which might disturb the smooth flow of water.

It is of profound importance for good performance of the CA40/42/50/52 that the water flowing over the transducer be free of bubbles and aeration. If the transducer face is clean but the performance degrades with increasing vessel speed, then aeration of the water flowing under the transducer may be the cause of the

poor performance. Due to the varying design of ship's hulls and different operating speeds, there can be great variation in the amount of air bubbles which are carried beneath the hull. These bubbles tend to be carried close to the hull as they pass aft. For this reason, it is desirable for the transducer to be mounted on a fairing block which holds the transducer away from the hull and which directs the flow of aerated water around the sides of the transducer rather than over the face of the transducer.

On deep keeled vessels, care must be taken to ensure that the transducer beam will not be blocked by any part of the keel. Although the appropriate mounting location that meets all requirements depends on the type of vessel and its normal operating speeds, a practical choice is usually somewhere between one third and one half of the vessel's water line length from the bow. Leveling blocks may be designed accordingly to meet this requirement.

☞ The more the transducer protrudes from the hull, the better the results will be.

Particularly the lower frequency operation, interference from propeller noise can be a significant problem. This can be seen as an increase in the "noise" on the echosounder display when the propeller speed is increased. To help reduce this, the transducer" mounting face may be angled slightly forward on the order of 5° for the 50 kHz transducers and 3° for the 200 kHz transducers. The goal is to incline the transducer so that a line of sight along the transducer's radiating surface passes below the propeller.

☞ Keeping the propeller clean and free of any nicks or roughness will assist in minimizing interference from propeller noise due to cavitation.

#### Sources of noise to consider:

<i>Water/air noise</i>	<i>Acoustic noise</i>	<i>Electrical noise</i>
Air bubbles	Main engine	Noise from electrical cables
Turbulence	Reduction gear	Noise from generators
Propeller	propeller shaft Generators auxiliary engines Power plant for freezers Hydraulic pumps Rudder engine Bow thruster Stern thruster	Poor grounding of instrument Radiated noise from other instruments Dc – Dc converters Electrical winches Neon lights etc.

## 11.12 Installation of scanner unit

A radar's target detection capacity varies greatly depending on the fitted position of the scanner. An ideal fitting position is a location high above the ship's keel line where there is no obstacle all around the scanner. In an actual ship, such an ideal location is limited by various factors. Therefore, consider the following suggestions when you determine the place to install the scanner:

**A. Install scanner at a position as high as possible**

The higher the installation position, the longer the radio ranging distance. Install the scanner at a position as high as possible after considering the ship's hull structure and radar maintainability.

**B. Install scanner away from smoke-stack and mast**

If the scanner is installed at the same height as the smoke-stack or mast, radar waves may be blocked, creating shadow zones or generating false echoes. Therefore, do not install the scanner at such a position.

**C. Install scanner forward away from obstacle**

To avoid creating shadow zones or generating false echoes, install the scanner at a position nearer to the ship's bow away from obstacles. When installing the scanner on a mast, position it in front of the mast. (If obstacles cannot be avoided for the ship's structural reasons, refer to "Shifting away from obstacles" described in section 11.12.1.

**D. Do not install the scanner near hot or heat-generating items**

Do not install the scanner at a position where it may be subjected to smoke or hot air from smoke-stacks or heat from lamps.

**E. Install the scanner away from antennas or other equipment**

Install the scanner as far away as possible from the antennas of a direction finder, radio transceiver, etc..

**F. Make the cable length as short as possible**

Keep the distance from the scanner to the display within the standard cable length of 10 meters. If using a longer cable for unavoidable reasons, limit the cable length to a maximum of 100 meters.

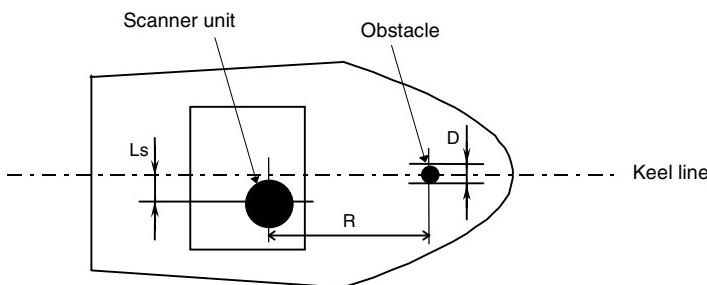
### 11.12.1 Shifting away from obstacles

*Shifting from keel line:* By shifting the scanner position from the keel line to the starboard side of the ship, it is possible to move shadow zones to the port side which makes it possible to keep a clear vision in the bow direction. The distance to be shifted can be obtained by calculation depending on the distance from the scanner to obstacles using the following equation:

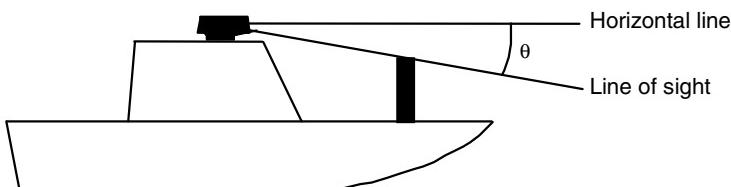
$$L_s = 0.4R + D/2 \text{ [m]} \quad (\text{when } R < 15\text{m})$$

$$L_s = 0.025R + D/2 \text{ [m]} \quad (\text{when } R > 15\text{m})$$

where       $L_s$ = distance to be shifted from keel line  
 $D$ = diameter of obstacle on keel line  
 $R$ = distance from scanner to obstacle



*Obtaining sufficient dip angle:* Raise the scanner position so that there is a sufficient dip angle available between the line of sight from the scanner to the obstacle and the horizontal line. By raising the dip angle above 5° it is possible to prevent mid and long distance shadow zones. The radar cannot detect objects below the line of sight.

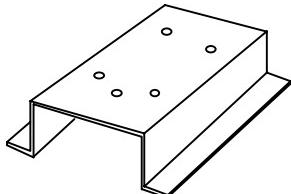


### 11.12.2 Mounting of scanner

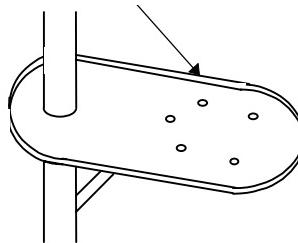
Deciding the place of installation, a minimum distance must be considered to the master compass (2 meters) and steering compass (1.4 meters). If a mount base like the one shown below is available, it may be easier to install the scanner. If not available, you may install the scanner directly to the roof, etc. In this case, pay attention to the water drain tube located at the bottom of the scanner unit during installation.

☞ When the radar mast or mounting bracket has a curvature of more than 2mm, repair it or use spacers.

Mount base.



Do not use an edge that might trap water.

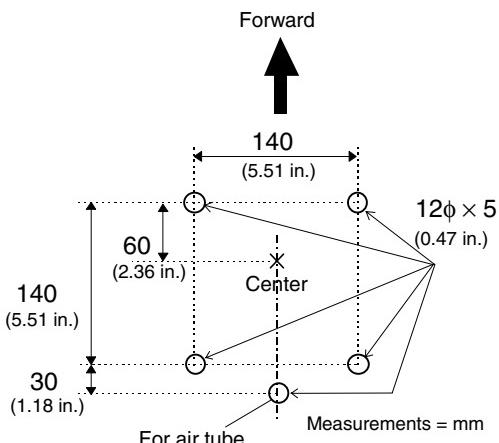
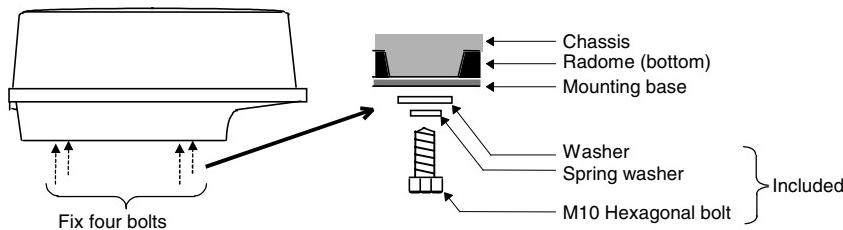
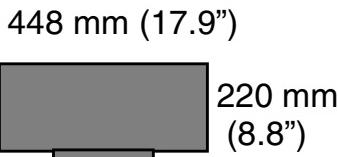


*Which size bolts to use for mounting of scanner unit:*

<i>Thickness of mount base</i>	<i>Bolt requirement</i>	<i>Material</i>	<i>Remarks</i>
1-4mm(0.04-0.16 in.)	M10 × 15 (1.5mm pitch)	Steel	
4-9mm(0.16-0.35 in.)	M10 × 20 (1.5mm pitch)	Steel	
9-14mm(0.35-0.55 in.)	M10 × 25 (1.5mm pitch)	Steel	Included with radar
14-19mm(0.55-0.75 in.)	M10 × 30 (1.5mm pitch)	Steel	

## RB714 Radome scanner

- 45cm radome
- 2kW
- Range up to 24nm
- Rotation speed 24rpm
- Beamwidth: Horizontal 5.9°  
Vertical 25°



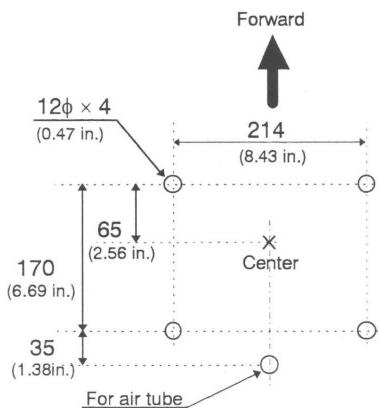
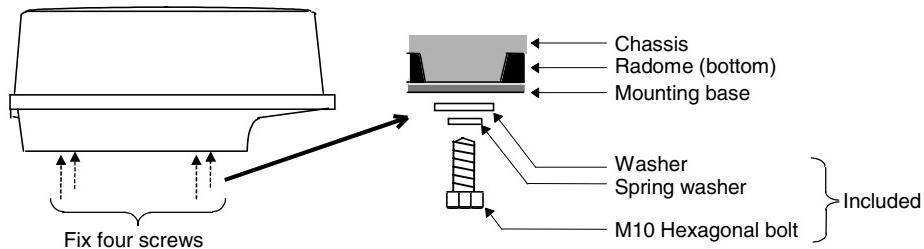
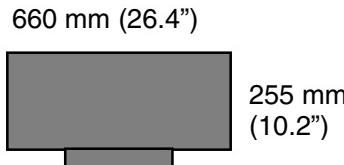
The bolts included with your radar equipment will suffice for mount base thickness of 9 to 14mm (0.35 to 0.55 in.). If the mount base is thicker or thinner than this, prepare bolts as listed on the previous page.

Silicone should be applied to secure the bolts. Do not use locking putty, as it may damage the radome.

**Drilling template for RB714A.**

## RB715A Radome scanner

- 65cm radome
- 4kW
- Range up to 36nm
- Rotation speed 24 or 48rpm
- Beamwidth: Horizontal 3.9°
- Vertical 25°



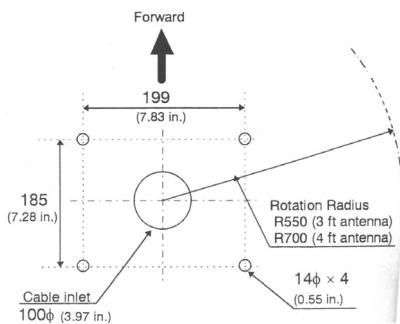
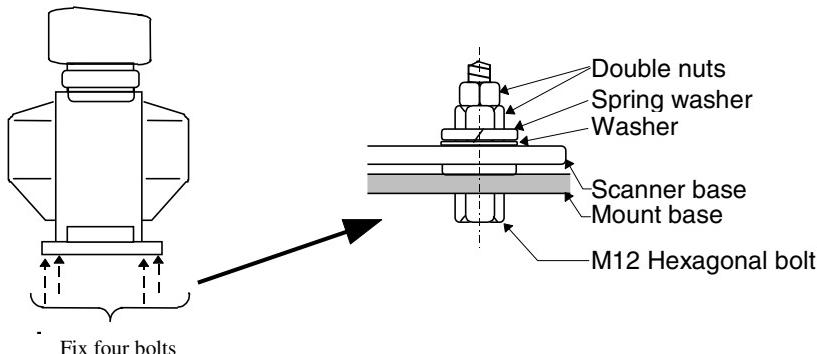
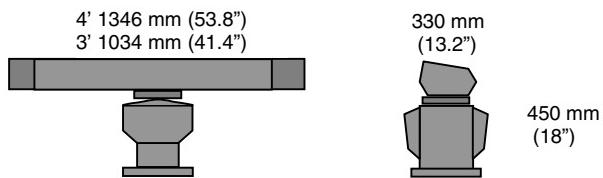
The bolts included with your radar equipment will suffice for mount base thickness of 9 to 14mm (0.35 to 0.55 in.). If the mount base is thicker or thinner than this, prepare bolts as listed on the previous page.

Silicone should be applied to secure the bolts. Do not use locking putty, as it may damage the radome.

**Drilling template for RB715A.**

## RB716A Open scanner

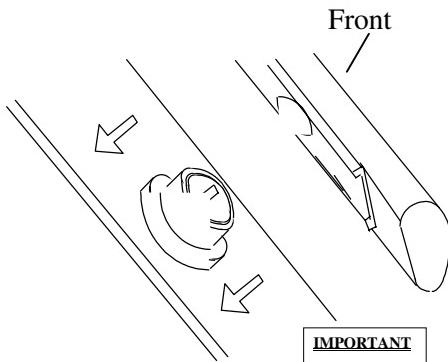
- 3 or 4ft Open array
- 4kW
- Range up to 48nm
- Rotation speed 24 or 48 (24V) rpm
- Beamwidth:
  - Horizontal 2.5°, 1.8°
  - Vertical 22°



The bolts included with your radar equipment will suffice for mount base thickness of 9 to 14mm (0.35 to 0.55 in.). If the mount base is thicker or thinner than this, prepare bolts as listed on the previous page.

Silicone should be applied to secure the bolts. Do not use locking putty, as it may damage the radome.

**Drilling template for RB716A.**



Remove the protective cap covering the rotary coupler on the top of the scanner. Match the antenna radiation direction to direction of the arrow on the rotation base and fix the antenna in position using the four M8 accessory bolts.

### 11.12.3 Connecting cables (length of cables – see 11.13 Specifications)

Run the cables by following the instructions below:

- Do not bind the cable for the radar collectively with cables of other equipment (especially the power supply cable).
- The cable has a connector fitted on the display and scanner side. If it is necessary to pass the cable through a narrow path, then fix the scanner side connector vertically by using vinyl tape before guiding the cable through the path.
- Run the cable along the ship's hull or wall surface, and fasten it at intervals of about 40 cm.

### Interconnecting cable (RB714A + RB715A)

Ensure that the radar is off. Connect the cable to the receptacle marked RADAR on the rear panel of the display unit.

Next, remove the upper part of the radome from the scanner unit. Avoid bumping it against the antenna by lifting vertically (there are four fixing screws). Remove the tape securing the antenna. Remove the shield cover located on the astern side (four fixing screws). Remove the cable clamping plate and rubber ring, pass the

cable through the cable inlet, place the rubber ring around the cable, and clamp the cable to the scanner unit with screws via the fixing plate.

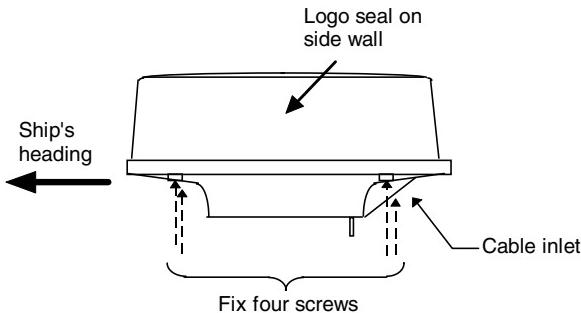
See ‘Fitting interconnecting cable’ for RB714A and RB715A further on in this section.

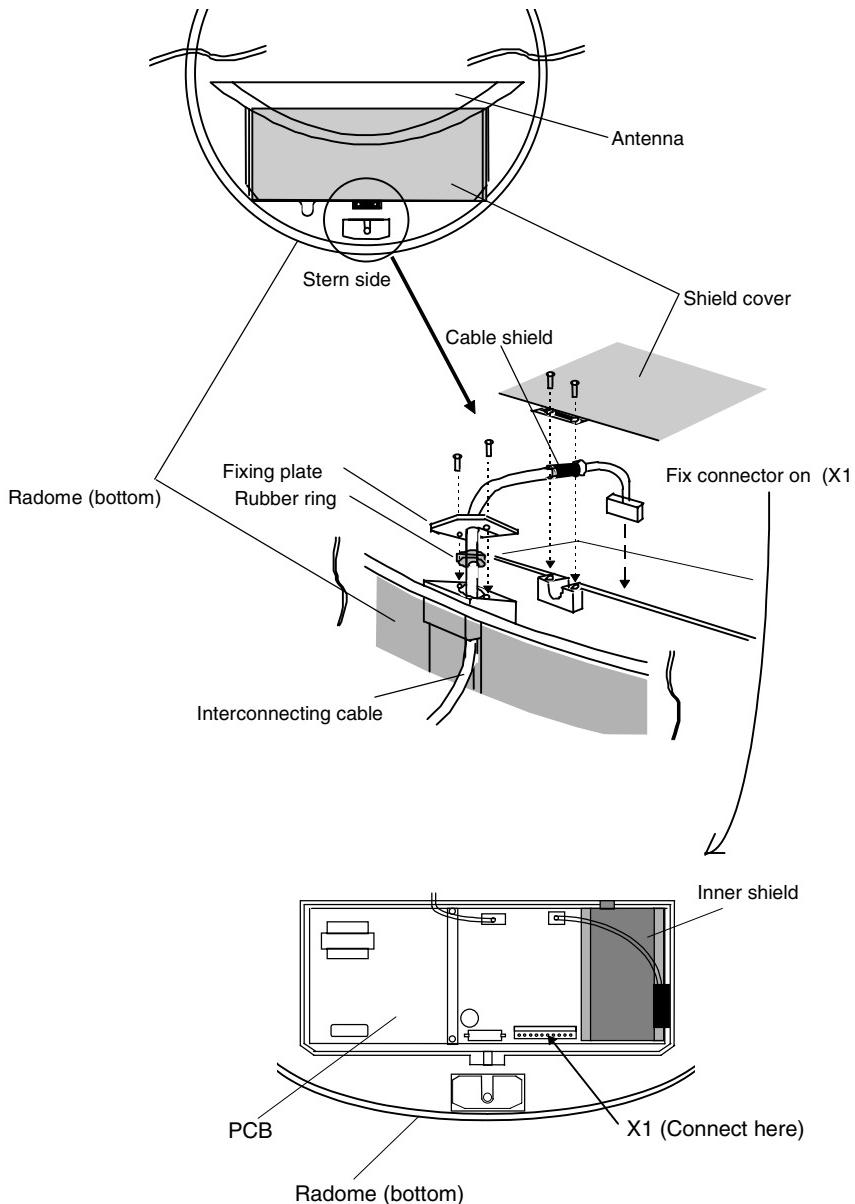
RB714A: Connect 10-pin connector to X1.

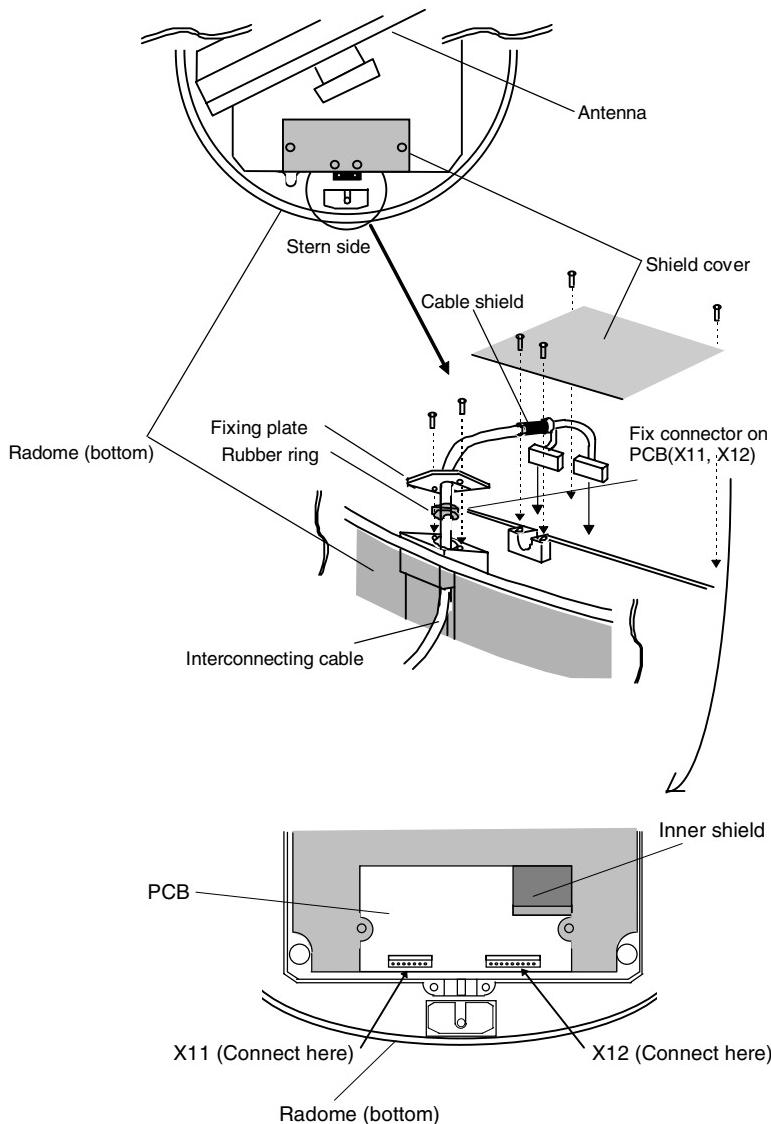
RB715A: Connect 7-pin connector to X11 and 9-pin connector to X12 of PCB.

*Replace the aluminum cover:* Attach a cable shield onto a ditch with the aluminum cover. Be careful that the cable does not get caught between main unit and cover, and that the antenna is free to rotate.

*Replace the upper part of the radome:* Be careful not to bump it against the antenna. Be sure that the cover is fitted in the correct direction (refer to below illustration). Align the upper and lower parts with the holes for the screws.



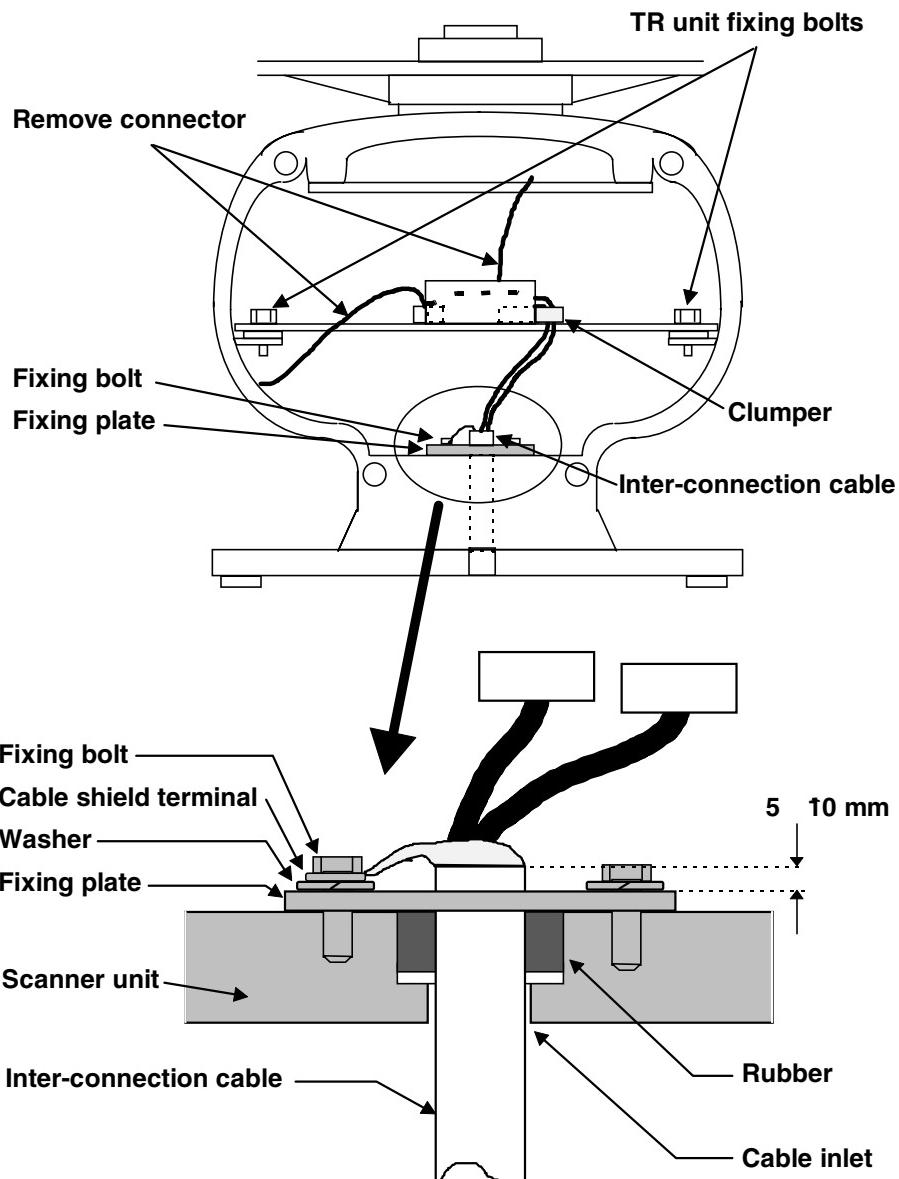
**Fitting interconnecting cable (RB714A):**

**Fitting interconnecting cable (RB715A):**

**Interconnecting cable (RB716A)**

1. Ensure that the radar is off.
2. Connect the cable to the receptacle marked RADAR on the rear panel of the display unit.
3. Use a T-wrench to remove the back covers of the scanner unit.
4. Remove the two bolts securing the transceiver and pull out the transceiver after removing two connectors (to Motor (X1), to Heading switch (X2)).
5. Remove the four bolts securing the fixing plate at the cable entrance.
6. Remove the metal fixing plate, rubber seal and washer that secures the cable.
7. Pass the cable through as shown in the diagram below.
8. Replace the above items and tighten the bolts.
9. Return the transceiver to its original position and secure it with the removed bolts.
10. Connect 7-pin connector to X11 and 9-pin connector to X12 of PCB.
11. Re-connect the two connectors removed at point 4.
12. Refit the scanner covers.
13. Take care the cable is not pinched when refitting the cover.

☞ See ‘Fitting interconnection cable’ on next page.

**Fitting interconnection cable (RB716A):**

### 11.12.4 Connector's pin numbers and wire colors

The connecting cable is supplied with the radar antenna. The 18-pin round connector is connected to the main unit's receptacle marked RADAR – refer to section 11.8 for details on pin numbers.

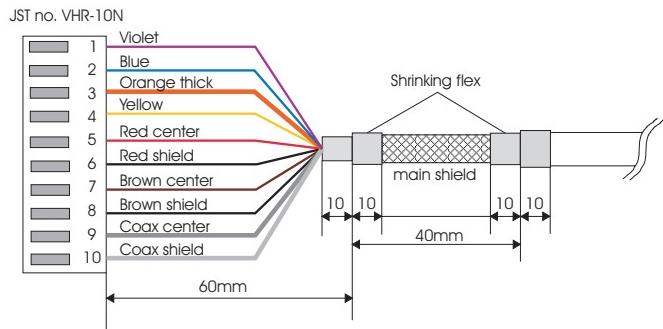
The connector at the other end of the connecting cable is for the radar antenna, and consist of the following pin numbers and wire colors:

#### Connector for the RB714A Radar antenna

Alternative colors:



- Pin 5: Red
- Pin 6: Green
- Pin 7: Brown
- Pin 8: White

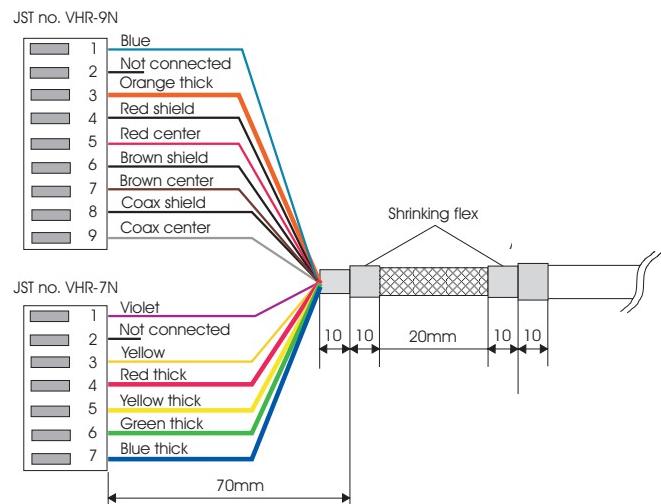


#### Connector for the RB715A Radar antenna

Alternative colors:



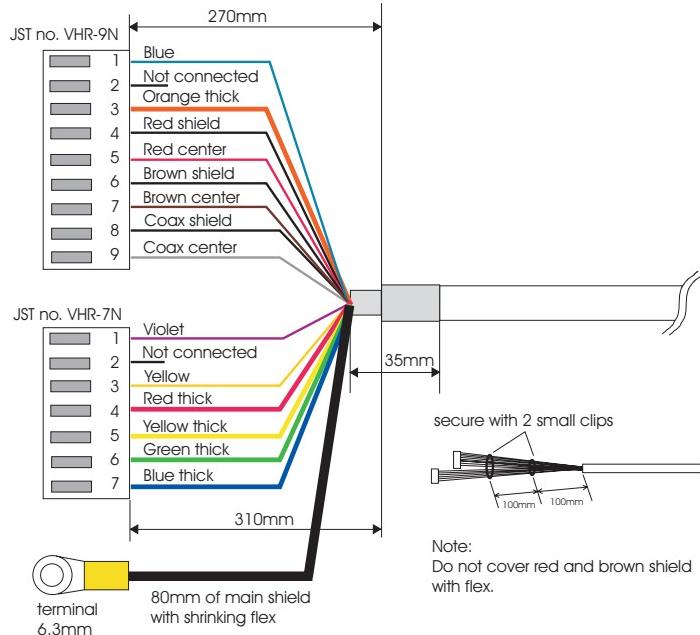
- Pin 4: Green
- Pin 5: Red
- Pin 6: White
- Pin 7: Brown



## Connector for the RB716A Radar antenna

**Alternative colors:**

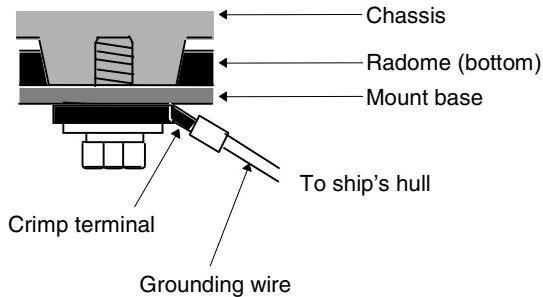
- Pin 4: Green  
 Pin 5: Red  
 Pin 6: White  
 Pin 7: Brown



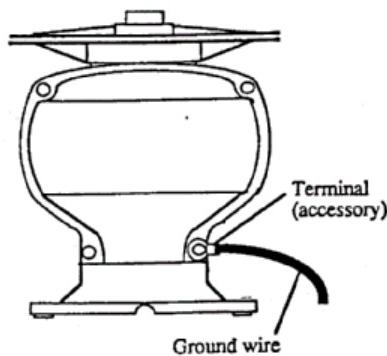
### 11.12.5 Grounding wire

Connect grounding wire from one of the bolts used for mounting the scanner unit to ship's hull. The crimp terminal and grounding wire are not included with the radar equipment.

#### Radome



#### Open scanner



## 11.12.6 Adjustment

When you have finished installing the scanner and display units and connecting cables, turn on the power to the display and scanner units and check to see if they operate normally without problem. Then make adjustments according to details in section 8.2.2 Initial radar display setup in the user manual. Be sure to follow these adjustments or the radar picture will not display a true image.

## 11.13 Specifications of the CA/CR40/42/50/52

### General data

Power supply:	12 & 24V dc (10-32V dc max) 20 - 70 Watts.
Dimensions:	- CA/CR40/42: H:220 (8.8") x L:365 (14.6") x D:75 (3") mm. - CA/CR50: H:300 (12") x L: 445 (17.8") x D: 90 (3.6") mm. - CA/CR52: H:330 (13") x L: 460 (18.1") x D: 95 (3.7") mm.
Environment:	0°C to +50°C, waterproof USC 46 CFR and IP55.
Housing:	Casted aluminum back, polycarbonate front.
Weight:	CA/CR40/42: 3.7 kg (8.1 lbs.), CA/CR50: 5.3 kg (11.7 lbs.), CA/CR52: 6.6 kg (14.5 lbs.),
Display:	TFT/ATFT color, power backlight, 640x480 pixels, CA/CR40/42 = 10.4 in, CA/CR50 = 13.8 in., CA/CR52 = 15 in.
Presentation:	4 pages (screen layers) each with several screen combinations. Manual operation or automatic rotation of the 4 pages.
Interfacing:	2 ports in/out NMEA 0183/0182/0180.
Alarm/log output:	Alarm relay (contact closure). 200 pulses/nm (5 Volt pulses).
Main fuse:	F6.3A.

### GPS section

Receiver type:	14 channel parallel, C/A code, 8 state Kalman filter.
Accuracy:	- standard: Position: 8m RMS* 15m – 95% of fixes. Speed: 0.1 kn* Heading: 1°*
	- DGPS: Position: 1-3m RMS
	- SDGPS: Position: 2-6m RMS
Speed filter:	10 settings.
Update rate:	1 second interval, typical
Dynamics:	Velocity: 600 km/h Acceleration: 10m/s <sup>2</sup>

**GPS Antenna RS5640**

Type: Quadrifilar Helix.  
 Dimensions: L:230mm, D:38mm  
 Weight: 150gr (0.33 lbs)  
 Environment: -35°C to +75°C, 95% rel.  
 Mounting: 1" 14 thread (standard US).  
 Cable: 10m RG58 (standard), 15m RG58 (option) - Max. 30m RG213.

**DGPS Antenna MGL-3**

Patch (GPS) H-field (diff.).  
 H:75mm, D:127mm  
 600gr (1.3 lbs)

**Chartplotter section**

Chart system: C-MAP NT+  
 Presentation: Two charts in different scales on screen simultaneously.  
 Radar and chart split-screen.

**Echosounder section (CA40/42/50/52)**

Frequencies: 38, 50 and 200 kHz, selectable.  
 Output power: Variable up to 1kW RMS per channel.  
 Impedance: 75 ohms  
 Display ranges: 3 to 3000 meters in 21 steps, and auto.

Detection  
 ranges: Frequency Beam Fish\* Bottom\*  
           38 kHz   13x21° 410m 1800m  
           50 kHz   10x16° 430m 1500m  
           200 kHz   7°     290m 550m

\*Single Fish Target Strength: -30dB (60cm cod)

\*Bottom Back Scattering Strength: -20dB

\*Simrad transducer C38/200 or C50/200

Pulse length: Short, medium, long and auto.  
 Max. transmission rate: 10 pings per second.  
 Alarms: Fish, max. and min. depth.  
 Zoom mode: Bottom and VRM expansion = 3 to 50 meters, feet or fathoms.  
 Event markers: At current echo (ping) and depth memory.  
 Picture speed: True distance or time (3 steps), 1 step/ping and freeze.  
 Noise filter: User-selectable on/off.  
 Presentation: A-scope and white line discrimination.  
 Temperature: Transducer or NMEA.  
 Speed: Transducer or NMEA.

## Dual frequency transducers

Simrad C38/200, 1kW high performance combi transducer 38 and 200kHz, 13x21° and 7° beams.

Simrad C50/200, 1kW high performance combi transducer 50 and 200kHz, 10x16° and 7° beams.

Airmar B250-22, 1kW combi transducer 50 and 200kHz, 19° and 6° beams.

## Alternative 50/200kHz medium-range transducers (Airmar Des.A)

B256,	1kW medium range transducer 16x28° and 4x6° beams.
B45,	600W Bronze stem mount transducer 45° and 15° beam.
B744V,	600W Bronze through hull triducer, depth, speed and temperature, 45° and 15° beam.
P52,	600W plastic transom mount triducer, depth, speed and temperature, 45° and 15° beam.
P319,	600W plastic through hull transducer 45° and 15° beam.
ST650,	Speed and temperature only.

## Radar section

Display modes: Head Up, North Up, True Motion. Dual Range.

Range scale: 0.125 – 48nm in 11 steps or multi range.

Min. range: 30 meters

Range

resolution: 30 meters

Bearing

accuracy: 1° or better

Off-center: Max 66%.

Guard zone: Can be set at any desired distance and angle in any desired width.  
IN and OUT modes are available.

Stretch: AUTO, PULSE, VIDEO.

Trail (wake): 30 sec., 1, 2, 5, 10, 15, 30 min. or permanent.

## Radar supply box RS4050

Dimensions: H:125mm, L:222mm, D:81mm

Two variants: 183-0700-001 Rev.A or 183-0700-003

Power cable: With 3 pin connector. With 3 or 4 pin connector.

Fuses: Radar supply fuse 4A F

Main fuse 6A.3F

High voltage 160 mA F

Main fuse 6A.3F

High voltage 160 mA F

Radar motor fuse 6A.3F

<b>Radar antennas</b>	<b>RB714A</b>	<b>RB715A</b>	<b>RB716A</b>	
Radome:	45cm	65cm		
Open array:			3 or 4 ft	
Scanner:	2kW	4kW	4kW	
Range:	to 24nm	to 36nm	to 48nm	
Rotation speed:	24rpm	24 or 48rpm	24 or 48 (24V) rpm	
Beamwidth:	Horizontal Vertical	5.9° 25°	3.9° 25° 2.5°, 1.8° 22°	
Cables:	10m 15m 20m 30m 40m	153.3002.012 153.3002.013 153.3002.014 153.3002.314 153.3002.414	153.3002.015 153.3002.016 153.3002.017 153.3002.317 153.3002.417	153.3002.008 153.3002.009 153.3002.010 153.3002.310 153.3002.410

## Options

C-MAP NT+ electronic charts

Simrad DataCards

TL50 Turbo Loader

6-channel NMEA Buffer RS5345

Universal connection cable, type AMW STYLE 2464

DS40/42 Dual station, 10" TFT/ATFT LCD color screen.

DS50 Dual station, 14" TFT LCD color screen.

DS52 Dual station, 15" TFT LCD color screen.

Sunhood



Agents                  *end of manual*

Connections,		Installation,	
-ECHO1 port	17	-CA/CR40/42	7
-ECHO2 port	17	-CA/CR50	9
-electrical	17	-CA/CR52	11
-external log/pos-status relay	17	-connecting cables to scanner	35
-external MOB switches	17	-connector's pin numbers and	
-fuse	19	colors	41
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